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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/648,340	08/27/2003	Kiyoshi Ogishima	4034-40	5339
23117 7590 06/12/2007 NIXON & VANDERHYE, PC 901 NORTH GLEBE ROAD, 11TH FLOOR ARLINGTON, VA 22203			EXAMINER CHEN, WEN YING PATTY	
			ART UNIT 2871	PAPER NUMBER
			MAIL DATE 06/12/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/648,340	Applicant(s) OGISHIMA ET AL.	
	Examiner W. Patty Chen	Art Unit 2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,2,4-8 and 10-26 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1,2,4-8,10-13 and 20-25 is/are allowed.
- 6) ☒ Claim(s) 14-19 and 26 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on Mar. 13, 2007 has been entered.

Response to Amendment

The Amendment filed on Feb. 12, 2007 has been entered. Claims 1, 2, 4-8 and 10-26 remain pending in the current application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

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2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 14-15, 17, 19 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 5309264) in view of Kim et al. (US 2001/0019388).

With respect to claims 14 and 26 (Amended): Lien et al. disclose in Figure 2 a liquid crystal display device comprising:

a first substrate (as shown in Figure 1, element 22), a second substrate (as shown in Figure 1, element 24), a vertical alignment type liquid crystal layer (as shown in Figure 1, element 36) including liquid crystal molecules having negative dielectric anisotropy (Column 3, lines 32-33) disposed between the first substrate and the second substrate, the liquid crystal display device being a vertical alignment type display wherein in an off state liquid crystal molecules of the liquid crystal layer are aligned substantially vertical (Column 3, lines 22-24) and at least one vertical alignment film (as shown in Figure 1, elements 38, 40) is provided for so aligning the liquid crystal molecules in the substantially vertical manner in the off state, and a pair of polarizing plates (as shown in Figure 1, elements 46, 48) placed opposing to each other.

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via the liquid crystal layer so that their polarization axes (elements 66, 68) are substantially perpendicular to each other (Column 4, lines 37-47),

the device having a plurality of picture-element regions each defined by a first electrode (element 60, same as element 26 as shown in Figure 1) placed in the first substrate on the side facing the liquid crystal layer and a second electrode (element 62, same as element 28 as shown in Figure 1) placed in the second substrate to oppose to the first electrode via the liquid crystal layer,

in each of the plurality of picture-element regions, the liquid crystal layer having a plurality of liquid crystal regions (elements I, II, III, IV) different in the direction in which the liquid crystal molecules tilt when a voltage is applied between the first electrode and the second electrode (Column 4, lines 24-31),

wherein in each of the plurality of picture-element regions a first region and a second region (regions along the edges of element 64) in each of which liquid crystal molecules tilt in directions substantially parallel to the polarization axes of the pair of polarizing plates when a voltage is applied between the first electrode and the second electrode, and wherein each of the first region and the second region extend across a substantial part of the picture-element region (as shown in Figure 2).

Lien et al. failed to disclose forming at least one light-shield layer on at least one of the first substrate and the second substrate so as to overlap each of a first region and a second region and wherein the light-shield layer is located at a central area of a corresponding pixel of the display device and does not cover an edge of the pixel and does not cover any gate or data line and is substantially X-shaped.

However, Kim et al. disclose in Figure 3A of forming a light-shield layer (element 25 that is formed within the pixel region) corresponding to and wider in width than the aperture 51 (wherein the light-shield layer corresponds to only the aperture, thus is formed locating at a central area of the pixel and does not cover the edge of the pixel and does not cover any gate or data lines). Hence, since Lien et al. disclose in Figure 2 that the aperture 64 is formed in the shape of X, located in the center of the pixel region, therefore, the light-shield layer disclosed by Kim et al. will also be formed in a substantially X shape corresponding to the aperture 64. Further, since Kim et al. disclose that the light-shield layer is formed wider than the aperture, thus, the light-shield layer will overlap the first and second regions having liquid crystal molecules substantially parallel to the polarization axes.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display as taught by Lien et al. wherein a light-shield layer is formed to correspond to the aperture within the pixel region as taught by Kim et al., since Kim et al. teach that occurrences of leakage of light can thus be prevented (Paragraph 0052).

As to claim 15: Kim et al. further disclose in Figure 3A that the light-shield layer (element 25 that is formed corresponding to the aperture 51) is placed substantially right on the liquid crystal layer.

As to claim 17: Lien et al. further disclose in Figure 2 that at least one of the first electrode and the second electrode has at least one opening (element 64), and the direction in which liquid crystal molecules tilt in each of the plurality of liquid crystal regions is defined by

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an inclined electric field generated at an edge portion of the at least one opening when a voltage is applied between the first electrode and the second electrode (Column 4, lines 24-36).

As to claim 19: Lien et al. further disclose as shown in Figure 1 that the first substrate further includes switching elements (element 30) respectively placed to correspond to the plurality of picture-element regions, and

the first electrode comprises a plurality of picture-element electrodes (element 26) respectively placed for the plurality of picture-element regions and switched with the switching elements, and the second electrode (element 28) comprises at least one counter electrode opposed to the plurality of picture-element electrodes.

Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 5309264) and Kim et al. (US 2001/0019388) further in view of Sawasaki et al. (US 2002/0063834).

Lien et al. and Kim et al. disclose all of the limitations set forth in the previous claims, and Lien et al. further disclose in Figure 2 that at least one of the first substrate and the second substrate has at least one opening for regulating the direction in which liquid crystal molecules tilt, but both failed to disclose at least one protrusion having a slant side is formed on at least one of the substrates for regulating the direction in which liquid crystal molecules tilt.

However, it is art recognized equivalent to form either protrusions or openings on at least one of the two substrate as evident by Sawasaki et al. in Figures 37 and 39 and Paragraph 0014, wherein protrusions having a slant side can be formed instead of forming openings.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Lien et al. and Kim et al. wherein instead of openings protrusions having a slant side are formed on at least one of the first substrate and the second substrate for regulating the direction in which liquid crystal molecules tilt, since forming protrusions or openings is art recognized equivalence.

Claim 18 is rejected under 35 U.S.C. 103(a) as being unpatentable over Lien et al. (US 5309264) and Kim et al. (US 2001/0019388) further in view of Kubo et al. (US 2002/0075436).

Lien et al. and Kim et al. disclose all of the limitations set forth in the previous claims and Lien et al. further disclose in Figure 2 that at least one of the first electrode and the second electrode has at least one opening (element 64), and the direction in which liquid crystal molecules tilt in each of the plurality of liquid crystal regions is defined by an inclined electric field generated at an edge portion of the at least one opening when a voltage is applied between the first electrode and the second electrode (Column 4, lines 24-36), but both failed to disclose that at least one of the first substrate and the second substrate comprising at least one protrusion having a slant side formed on the surface facing the liquid crystal layer.

However, Kim et al. disclose in Figure 3A of forming at least one protrusion (element 53) on at least one of the substrates in the edge portions of the pixel region in addition to the opening formed in the center of the pixel region and Kubo et al. teach of forming protrusions with slant sides.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to construct a liquid crystal display device as taught by Lien et al. and Kim

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et al. wherein one of the substrates further comprises at least one protrusions formed in the edge portion of the pixel electrode as taught by Kim et al., since Kim et al. teach that by forming the protrusions helps to improve viewing angle near edge of the pixel (Paragraph 0068) and wherein the protrusions are formed with slant sides as taught by Kubo et al., since Kubo et al. teach that by forming protrusions with slant sides helps to stabilize the radially-inclined orientation of the liquid crystal molecules (Paragraph 0289).

Allowable Subject Matter

Claims 1-2, 4-8, 10-13 and 20-25 are allowed.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to claims 1, 8, 22 and 23 (Amended): None of the prior arts either alone or in combination fairly teach or suggest that the depth D of the light-shielding layer satisfies a relationship of $D + T_3 / 2 = \sqrt{3}xP / 2$. Therefore, claims 1, 8, 22 and 23 are deemed non-obvious and inventive over the prior arts, thus are allowed.

As to claims 2, 4-7, 10-13, 20-21 and 24-25: Since claims 2, 4-7, 10-13, 20-21 and 24-25 depend directly on the allowed claims 1, 8, 22 and 23, therefore are also allowed.

Response to Arguments

Applicant's arguments with respect to claims 14 and 26 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion


Any inquiry concerning this communication or earlier communications from the examiner should be directed to W. Patty Chen whose telephone number is (571)272-8444. The examiner can normally be reached on 8:00-5:00 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David C. Nelms can be reached on (571)272-1787. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

W. Patty Chen
Examiner
Art Unit 2871

WPC
6/06/07


ANDREW SCHECHTER
PRIMARY EXAMINER